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Adolescent's life purpose in a Science & Technology program

Projeto de vida de adolescentes em um programa de Ciência & Tecnologia

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Abstract

Adolescents undergo major biopsychosocial changes and having a life purpose can be a protection for positive development. This study analyzed the life purpose of 18 adolescents (15-20 years old, with an average family income of R$ 1,625.00), holders of scholarship from a social program in a Science & Technology Center. They answered the Scale of Life Purpose for Adolescents Questionnaire and participated in a focus group about the impact of this program in their life project. The responses were reviewed using the Software Interface de R pour les Analyses Multidimensionnelles de Textes et de Questionnaires, and were organized in two *corpora* – Life Project and Social Program. Ten-year projects are based on the Material, Study/Work, and Positive Aspiration dimensions. Adolescents show a life purpose connected to their community that can be caused by the fact of being a participant in a social program, enabling better access to education and a closer contact with the community.

Keywords: Adolescent; Developmental psychology; Positive psychology; Social programs.

Resumo

Adolescentes passam por importantes mudanças biopsicossociais, e ter um projeto de vida pode ser um fator protetivo ao desenvolvimento positivo. Este estudo analisou o projeto de vida de 18 adolescentes (15-20 anos, com renda familiar média

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de R$ 1.625,00), bolsistas de um programa social em um Centro de Ciência & Tecnologia. Os adolescentes responderam a Escala de Projetos de Vida para Adolescentes e participaram de um grupo focal sobre impacto desse programa no projeto de vida. Analisaram-se as falas pelo software Interface de R pour les Analyses Multidimensionnelles de Textes et de Questionnaires, organizando-as em dois corpora – Projeto de Vida e Programa Social. Os projetos de vida para 10 anos baseiam-se nas dimensões Bens Materiais, Estudo/Trabalho e Aspirações Positivas. Os adolescentes apresentaram projetos de vida conectados à comunidade, o que pode estar relacionado ao fato de ser um participante do programa social, possibilitando melhor acesso à educação e o contato mais próximo com a comunidade.

Palavras-chave: *Adolescente; Psicologia do desenvolvimento; Psicologia positiva; Programas sociais.*

The definition of adolescence still steers discussions about adolescence's extension and characteristics, as well as its naturalization in society. Currently, it still tends to be seen as a stage in the development of biological maturation factors, causing crises, disorder, irritability and delinquency (Moreira, Rosário, & Santos, 2011; Silva, Barbosa, Barbosa, Cruz, & Marques, 2016). Within this perspective, the political perception of serving this population is also that these are factors considered as social problems to be avoided and worthy public attention, from the perspective of institutionalization, especially for young people belonging to vulnerable socioeconomic classes (Silva et al., 2016; Rossi, Marcolino, Speranza, & Cid, 2019). Inserted in this perspective in which the adolescent is seen as the "cause" of social problems, there is no attempt to analyze which social factors stemming from reality, such as social inequality, unemployment, and the lack of access to opportunities. It is an error to see that these young people are inserted in a realm that lacks greater resourcefulness on the part of the State and other sectors of society, where high rates of violence, poverty and social inequality are present (Silva et al., 2016).

Likewise, both science and education fail when they pass on and popularize knowledge to the young population. Despite public policies geared to the popularization of Science and Technology (S&T), in a more recent survey by the Center for Management and Strategic Studies (2015) on the perception of S&T in the country, 61% of the 1,962 Brazilian adolescents and adults interviewed showed interest in this field – yet, on the other hand, the majority reports being informed "never, or almost never" on the subject, and only 13% know any scientific research institution. Thus, it is necessary to seek strategies for the dissemination and popularization of this scientific knowledge to the population of all social segments, reducing the huge gap between scientific production and public understanding existing today.

Martins, Coelho, and Miranda (2004, p. 283, our translation)[2] postulate that "[...] to popularize is to recreate scientific knowledge in some way" – that is, to seek to reframe this knowledge, which is sometimes inaccessible due to a technical and far-fetched language, in a way that makes sense if applied to the daily lives of this population. Therefore, the importance of social inclusion through science is addressed again and helps to support the individuals, duly informed, in their expansion of conditions to understand their environment and politically operate accordingly (Motta-Roth & Scherer, 2016).

Based on that, the Positive Psychology view of institutions and programs with positive characteristics is addressed again, in which programs with semi-structured or structured activities for groups of young people, with well-defined specific objectives, can promote interpersonal connections, resilience, develop self-efficacy and provide opportunities for pro-social behavior (Benson & Saito, 2000; Kern, Nansook, & Romer, 2005; Lomas & Ivtzan, 2016). Along this line, the field of Psychology provides us with a view of adolescence as a period in which its characteristics are intrinsically linked to historical and cultural peculiarities, with the existence of some criteria that can assist in their understanding – especially chronological criteria related to biological, psychological, and social changes, which is seen in our society as a period of self-knowledge and experimentation (Silva et al., 2016).

[2] In original: "*[...] popularizar é recriar de alguma maneira o conhecimento científico*" (Martins, Coelho, & Miranda, 2004, p. 283).

In an attempt to transform this view of problem-teenagers and provide these young people with spaces to discuss and outline concrete plans for the future, in the present study, it is assumed that Social Programs (SP) aiming at integrating and making adolescents and young people protagonists within their community could assist in the construction of their Life Projects (LP) and, thus, contribute to a positive development. In this perspective, McKnight and Kashdan (2009, p. 224) characterize the LP as "centralized, self-organizing life aim that organizes and stimulates goals, manages behaviors, and provides a sense of meaning".

Still addressing Life Programs, Damon (2009) points at some key factors about the concept: (a) the presence of developmental factors in the construction of these projects, which would be transformed and resized over the course of life and at different stages of development; (b) the meaning, significance and direction of life as a self-organizing aspect to determine directions; (c) the importance of the cultural and community context in the construction of this project, which despite being an individual act is carried out from specific cultural and historical moments, and that being aware of his/her own context and available resources is vital to reflect on his/her needs, goals and aspirations; and (d) the inclusion of other people, groups and institutions within his/her LP.

In the literature, studies have shown the presence of an LP as a potential protective factor in difficult future situations, and directing young people's behavior towards these goals can contribute to resilience, protecting the individual from potential risky behaviors (Damon, 2009; Lerner, Lerner, & Phelps, 2009; Machell, Disabato, & Kashdan, 2015), besides benefits involving psychological and physical health, assisting in factors of positive well-being, academic achievements and life satisfaction (Blau, Goldberg, & Benolol, 2018; Yeager & Bundick, 2009). To have a LP also favors the development of pro-social behaviors, belonging to the community, achievement, and self-esteem, promoting the development of LP based on the existing connections among adolescents and their families, teachers, peers and the communities where they are inserted (Benson & Saito, 2000; Blattner, Liang, Lund, & Spencer, 2013; Blau et al., 2018; Gutowski, White, Liang, Diamonti, & Berado, 2018; Liang et al., 2017).

Along this line, LP can play an important role as a central protective factor for adolescents who experience situations of marginalization. The liminality, unpredictability and stress arising from this type of situation can make adolescents lose sight of their prospects for a long, positive or predictable future (Sumner, Burrow, & Hill, 2018). However, the presence of a well-established LP can add meaning to these projects (Suárez-Orozco, Hernández, & Casanova, 2015), strengthen the youngsters' belonging to their community (Chen & Miller, 2012; Liang et al., 2017) and direct them to a civic LP and aimed at easing the difficulties encountered by their social group (Godfrey & Cherng, 2016; Malin, Ballard, & Damon, 2015).

In view of the factors exposed here and in line with the Positive Psychology and positive youth development movement, which characterizes adolescence as a period of resources and potential (Damon, 2004), the existence of adversities and developmental challenges in the contexts of adolescents inserted in this reality is acknowledged. On the other hand, it refuses to limit the concept of human development and performing in institutions that serve the young public to the mere effort to overcome deficits and risks. Therefore, this investigation reviewed the LP of adolescents inserted in a SP linked to a Federal Science & Technology Center, examining the formative role of this SP based on the theory of positive youth development and the LP construction.

Method

A descriptive and exploratory study was carried out, with a mixed design, including quantitative analyzes of data from behavioral scales and qualitative analyzes of verbal reports recorded in focus groups (Shaughnessy, Zechmeister, & Zechmeister, 2012). To ensure better quality of the data obtained, the Consolidated Criteria

for Reporting Qualitative Research (COREQ) (Tong, Sainsbury, & Craig, 2007) was applied. The study was approved by the Human Research Ethics Committee, of the Pontifical Catholic University of Campinas, under number 2,808,029 and Certificate of Presentation for Ethical Appreciation (CAAE) 90996318.1.0000.5481, according to CNS Resolution nº 466/12 and the Resolution CNS 510/16.

Participants

A convenience sample was composed with 18 adolescents, aged between 15 and 19 years (M_{age} = 17.5; *SD* = 1.5), 14 (77.7%) of whom were female. They all participated weekly, as scholarship recipients, in a SP of a Technological Center, in a city in the interior of the State of São Paulo, Brazil. Most of the participants had been part of the project for a year, attended high school (61.0%) in a public school (except for one participant who attended private Higher Education), and had average family income in the C1 stratum (R$ 1.625.00), according to the *Associação Brasileira de Empresas de Pesquisa* (ABEP, Brazil Economic Classification Criterion) (Associação Brasileira de Empresas de Pesquisa [ABEP], 2017).

The SP consisted of workshops on artistic and cultural activities using scientific and technological tools, organized by teenagers for a population of children and teenagers from an adjacent low-income community, with the purpose of stimulating students' development.

Instruments

Participant Characterization Sheet – It was designed to characterize the participants, with personal data and referring to participation in the SP, in addition to the socioeconomic variables of the family, according to the ABEP (ABEP, 2017).

Scale of Life Projects for Adolescents [LPS-A] (Gobbo, Nakano, & Dellazzana-Zanon, 2018; validation of Dellazzana-Zanon, Zanon, Noronha, Oliveira, & Rosado, 2019) – The scale has two versions, proposing that young people project themselves 10 and 20 years ahead. The 10-year version includes 48 items, and the 20-year version includes 53 items, which are answered in a five-point Likert scale format, from "Totally Disagree" to "Totally Agree". The items in the 20-year version (v. 20) are configured in six dimensions regarding the construction of LP; the 10-year version (v. 10) presents a junction between dimensions B and C (Study and Work), resulting in a total of five dimensions: (a) Affective Relationships (v.10: 9 items; v. 20: 6 items); (b) Study (v. 10: includes Work – 9 items; v. 20: 13 items); (c) Work (v. 20: 4 items); (d) Positive Aspirations (v. 10: 10 items; v. 20: 11 items); (e) Material Goods (v. 10: 9 items; v. 20: 8 items); and (f) Religion / Spirituality (v. 10: 11 items; v. 20: 11 items).

Focus Group Interview Script – with nine open ended questions on two themes – Life Projects and Actions in the Social Program. The questions were based on the literature in the area (Kern et al., 2005) to try to assess the relationships of the SP with the characteristics of positive programs and institutions: (a) promotion of interpersonal connections; (b) support to resilience; (c) promoting skills; (d) encouraging self-determination; (e) developing self-efficacy; (f) nurture a clear and positive identity; (g) promoting beliefs for the future; (h) recognizing positive behaviors; (i) providing opportunities for pro-social behavior; and (j) establish pro-social norms.

Procedures

A pilot application was carried out with three SP multipliers scholarship holders, seeking to identify the adequacy of the process set up for data collection. After this step and the consent of the participants and their guardians, the sample was divided into three groups consisting of five adolescents each, who completed the

Participant Characterization Sheet and then answered the LPS-A. Finally, the focus group on LPs was carried out, in which the investigator (male) acted as moderator of the group and a psychologist (female) from the institution assisted as an observer. Both already had established a previous relationship with the population and with the institution, having participated in the SP activities for three years.

The applications and debates were held in a meeting room provided by the institution, and recorded on tape, in order to assist in the transcription of the contents and in later assessments. Field notes were also produced by the investigator and the transcripts were shared with the observing psychologist for amendments or comments. In total, four meetings were held, with approximately 1hrs 30mins. each, during the months of August to October 2018. Feedbacks were also held after the end of the investigation process with the participants and SP coordinators, with view at sharing the analyses that could facilitate teenagers to reflect on their future.

Data Analysis

The data collection procedure yielded information that was coded and organized by the investigator in an electronic data spreadsheet in Excel® software, and simple statistical tests of mean and frequency were applied. The data from the focus group were checked and corrected by the observational psychologist and then transcribed, grouped, encoded in the Notepad ++ software and added for data processing in the software Interface de R pour les Analyses Multidimensionnelles de Textes et de Questionnaires (IRaMuTeq) version 0.7 Alpha 2 (Ratinaud, 2020).

Results

For the analysis of LPS-A, the sample was divided into two age groups 15-17 years (*n* = 6) and 18-20 years (*n* = 12). Projecting life 10 years forward, in both age groups, higher average scores are found in the dimensions Material Goods, Study/Work and Positive Aspirations and lower scores for Religion/Spirituality and Affective Relationships. Considering the 20 years forward projection, for both groups, there was an inversion in one dimension, but maintaining the previous three with higher average scores – Study/Work, Material Goods and Positive Aspirations; also maintaining the dimensions with less frequency (Table 1).

Table 1
Descriptive results of the Life Projects Scale – Version 10 years and 20 years, in scholarship holders of the Social Program of S&T Science and Technology (N = 18)

Life Project Dimensions – Version 10 years (Number of Items)	15 – 17 years (*n* = 6)				18 – 20 years (*n* = 12)			
	M	*(SD)*	*Mdn*	*(Mín-Max)*	*M*	*(SD)*	*Mdn*	*(Mín-Max)*
Religion/Spirituality (*n* = 11)	32	(7.8)	34.5	(20-42)	27	(11.3)	26.0	(15-52)
Positive Aspirations (*n* = 10)	41	(1.5)	39.5	(26-43)	42	(1.3)	39.0	(36-45)
Study/Work (*n* = 9)	36	(1.6)	35.5	(34-38)	36	(2.4)	36.5	(33-42)
Material Goods (*n* = 9)	34	(4.8)	35.0	(26-40)	37	(4.3)	38.0	(28-43)
Affective Relationships (*n* = 9)	30	(4.6)	30.5	(25-38)	29	(3.2)	30.0	(25-35)
Life Project Dimensions – Version 20 years (Number of Items)	15 – 17 years (*n* = 6)				18 – 20 years (*n* = 12)			
	M	*(SD)*	*Mdn*	*(Mín-Max)*	*M*	*(SD)*	*Mdn*	*(Mín-Max)*
Religion/Spirituality (*n* = 11)	32	(7.8)	34.5	(20-42)	27	(11.3)	26	(15-52)
Positive Aspirations (*n* = 11)	48	(2.8)	47.0	(42-52)	44	(1.4)	43	(35-45)
Study (*n* = 13)	49	(4.1)	51.0	(43-53)	51	(5.8)	52	(37-60)
Work (*n* = 4)	18	(0.5)	18.5	(18-19)	18	(1.7)	18	(14-20)
Material Goods (*n* = 8)	35	(2.9)	33.0	(29-38)	35	(3.7)	35	(28-39)
Affective Relationships (*n* = 6)	16	(2.2)	16.0	(14-20)	16	(3.4)	18	(10-21)

Note: Mdn: Median; M: Mean; SD: Standard Deviation.

The content analysis carried out using the IRaMuTeq software initially separated the texts transcribed from the focus groups into two analysis *corpora* – on the adolescents' LP, and the second related to the experiences of the scholarship holders in SP. The first *corpus* (LP) was divided into 106 texts, 151 Text Segments (TS), 4,301 occurrences ($M_{ocurrences/text}$ = 40.57) and 869 shapes. The analysis of the Descending Hierarchical Classification retained 131 TS (86.75%), which generated six distinct Classes, the first five relating to plans and expectations for the future and the last one concerning LP in relation to SP in the present: (a) Connected plans for the future, (b) Individual plans for the future, (c) Wishes for the near future, (d) Wishes for the distant future, (e) Plans for family and parents, and (f) Contributions of the social program in the present (Figure 1).

The software also generated a subdivision, opposing Classes 1, 2 and 5 (TS = 48%), relating to plans for the future, to Classes 3 and 4, which concern aspirations and desires in the more distant future. Finally, there were two subdivisions – between Classes 1 and 2, dividing the plans between individual and connected projects, and between Classes 3 and 4, separating the near and distant desires (Figure 1).

Class 1 – "Plans connected with the future" (TS = 14.5%) included as most frequent words ($p < 0.001$): "project [of life]", "behave", "better", "difference", "world", showing a feeling of connection with other individuals within the LP, through the words "world", "difference", "better" (Figure 1). Examples of Class 1 verbal reports:

> *I liked the question about making a difference in the* world. *I think this is the most important thing. It is also nice to think that we are doing this here in the social program, leaving our mark, passing the contents to the children* (Q16, emphasis added).
>
> *Sometimes, I think I'm going to do it for life too, you know? Do volunteer work. It's very good, we see the* difference *it makes in their lives. This is a sensational thing, it is very rewarding* (P7, emphasis added).

Class 2 – "Individual plans for the future" (TS = 16.8%), contains the words "want", "family", "continue", "study", "earn" and "college" ($p < 0.001$), portraying future plans of a more individual character, such as studying, earning money and starting a family. A subdivision of Class 2 generated Class 5 (TS = 16.8%), named "Plans referring to family and parents", considering the contact of adolescents with their own family

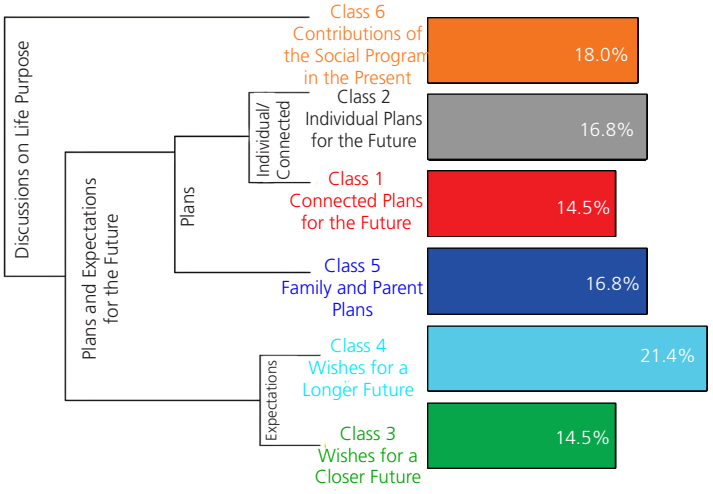

Figure 1. Dendogram resulting from the Descending Hierarchical Class of thematic reports on Life Projects of the scholarship holders of the Science and Technology Program (N = 18).

and relatives. The most frequent words were "[my] parents", "depends", "happen", "different", "change" and "independence" ($p < 0.001$) (Figure 1).

The expectations subdivision includes Class 3 – "Wishes for a near future" (TS = 14.5%), with more frequent words such as "right", "get it", "wait", "future" ($p < 0.001$). The reports show confidence in the present, indicating that they perceive themselves as being on the right path to achieve their goals in the near future, but that patience is needed to await the results (Figure 1). Class 4 – "Wishes for a distant future" (TS = 21.4%), refers to the wishes of adolescents beyond 10-year projections includes words such as "happy", "20 years", "10 years", "Wish", "[don't] know" ($p < 0.001$). Such reports point to a lack of concrete plans or long-term desires, with the search for happiness being these adolescents' main driver.

Finally, Class 6 – "Contributions of the social program in the present" (TS = 16.1%), which makes up a single *subcorpus*, is related to the adolescents' experience in the present. In large part, these are excerpts that refer to the SP, but that were raised during the discussion topic on LP, indicating the presence of the program in defining their future plans and desires. There is a higher frequency ($p \leq 0.001$) of the words "participants [of the SP]" (referring to the body of children and adolescents being educated), "children", "knowledge", "learning" and "perceiving", representing the importance of the experiences coming from SP, especially with regard to the contact with the children and adolescents trained by the program, as shown below:

> *I also think it marked me. And that the project changed that in me, made me have more empathy. Before, I had never entered a classroom like this, full of* children*, in this position, with a responsibility to share what I know with others. It is a very important* learning *process, learning to deal with so many different people, so many children. I never imagined that I would be in that situation, even more so soon* (Q14, emphasis added).
>
> *And the social program also showed me that I can pass on my research and impact someone's life. We applied my project in several schools, very precarious, with* children *who were in an environment of poverty, of constant problems with drugs, with everything that is despised by the model. And they trusted me, they trusted us, and we were someone who inspired them. Here too, I am 18 years old and the children call me 'aunt', 'madam', 'teacher'* (Q1, emphasis added).

From the dendrogram (Figure 1) and from reading the reports, we can observe that adolescents have projects designed for the near future (10 years) – but that there is uncertainty in relation to a more distant future (TS = 21%). This fact is largely due to the constant changes of the historical period in which they live and, in particular, to the characteristics of the actual area of S&T, in which many seek to insert themselves, in which changes occur frequently. In addition, the adolescents' search for independence from their family is present, in addition to the search for happiness.

Thereafter, the results of the Similitude Analysis (Figure 2) present the interconnections and level of associations of the words from their co-occurrences.

In Figure 2, there are two central elements – the words "to want" (referring to the future) and "to be" (referring to experiences in the present) – that have a strong connection with each other, indicating the connection between the activities carried out in the present to the future. Initially, reviewing the first of the central axes, it is clear that "wanting" is surrounded by desires and plans for the future – "college", "condition", "graduation", "happy", "job", "sustaining", "Independence". It is also possible to notice, next to the central term "want", words that indicate the connectivity between their LPs – like "community", "world" – and the community represented by "giving", here indicating contribution, which includes "neighborhood", "class", "explain" and "take", according to the excerpts:

> *In the suburbs then things are very difficult, but we stand together. I want to show that it's not just because we came from there that we don't have a chance. And I want to help others too, to have a better life, to make things better there* (Q13).
>
> [...] *but I think about maybe being a teacher, teaching. I think it helps me to feel important, to be doing something for other people, for the world, you know. That would make me happy* (Q3).

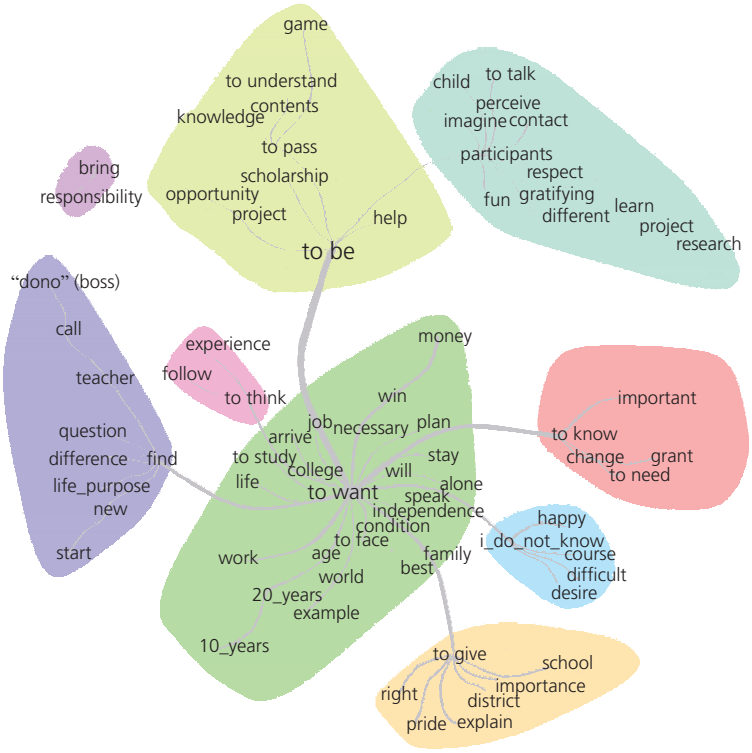

Figure 2. Graph of communities resulting from the Similitude Analysis of thematic reports on Life Project by the scholarship holders of the Social Program of Science and Technology (N = 18).

Note: Chi-Square Test – Heavier lines: stronger relationships; lighter lines: weaker relationships.

In the second central axis in Figure 2, "to be", the presence of a vocabulary used in order to talk about experiences in the present tense is noted. The community has words referring, mostly, to the participation of adolescents in SP, indicating the impact of the Program in their daily lives and in the formation of their LP. The use of words such as "Social Program", "opportunity", "technology", "passing", "knowledge" is presented, and broken down into another community with the presence of words such as "liking", "fun", "contact", "attention", "respect", "learn", "research", which suggests that the activities of knowledge multiplication generate a positive and important impact on the scholarship holders teenagers. Examples of reports that support this interpretation:

> *Yeah, I think that's the most important thing too. I think the project here helped me to feel that. The contact with the children, seeing how they learn here, we realize that - we have a responsibility with them, a trust. This is very tasty. I really wanted to be able to take this forward, to always have that contact whatever I am doing* (Q4).
>
> *– That's it. Share what we know so that we can multiply knowledge. I think this is very important. For example, when we play a game with the child on the computer, we 'are working on a lot of things. Working on what the child learned, or tried to learn, in the classroom, and making sense of it. Doing something that is fun and important to her. Give importance to what the child learns.*
>
> *– This is very crazy, right? We work a lot on it. As if we influence the life of a lot of people with something like this, from here to the future. It fills you with pride, it's very good. I want to keep feeling this. Feeling that what I do has an impact on people's lives* (Q7).

The second total division of the *corpus*, related to SP, contains 38 texts, with 2,922 occurrences (M = 77) and 236 *hapax*. The Descending Hierarchical Classification analysis retained 29 TS (76.32%),

generating five Classes, organized into two *subcorpora*: (a) Experiences as content multipliers (Classes 2 and 3); (b) Relative contents of their activities as S&T scholarship holders (Classes 1, 4, and 5) – Classes 1 and 4 (scientific research activities) were placed in opposition to Class 5 (experiences as a Scientific and Technological Initiation scholarship holder (Figure 3).

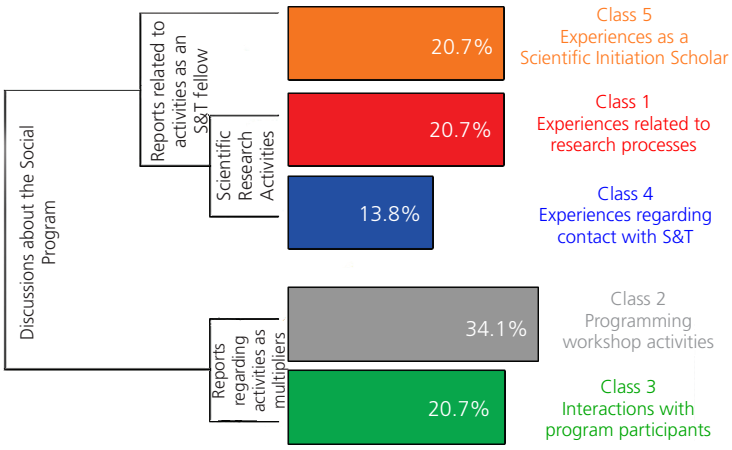

Figure 3. Dendogram resulting from the Descending Hierarchical Class of thematic reports on their participation in the Social Program, according to the scholarship holders of the Social Program for Science and Technology (*N* = 18).

In the accounts of their activities as multipliers, Class 3 has words like "example", "time", "coming", "problem", "knowing" and "important" ($p \leq 0.001$). Together, they relate to interactions with SP participants, as shown by the reports:

> *We end up learning a little about dealing with* problems. *There is always a problem and we have to run and think about something together to solve it.* Sometimes*, it is something from our research, sometimes it is from activities, sometimes it is something in the day with the kids, for* example. *Then, we run to fix it together* (Q15, emphasis added).
>
> *I see that I have changed a lot. I learned to be more patient, to know how to deal with other people. And it is very* important to know *how to pass on what you know to other people, to show your research to the others. But, to do it in a way that is closer to the person, in a way that he/she understands, in a way that he/she sees the usefulness. It is something that is lacking today, this ability to speak the language of the other* (Q18, emphasis added).

Class 2 contains the words "Scratch [programming language used in SP activities]", "want", "help", "contact", "game" and "programming" ($p < 0.001$), referring to the activities carried out, specifically, in the programming workshops. Class 5 concerns the experience as a Scientific & Technological Initiation's scholarship holders, separated from the remaining subdivision. Here, the related words are "scholarship", "experience", "receive", "before" and "now" ($p \leq 0.001$). Within the subdivision referring to scientific research activities, Class 4 contains references to the young person's contacts with S&T – such as "science", "always", "knowledge", "needing" ($p \leq 0.001$). Finally, Class 1 presents a vocabulary that revolves around the contact of the scholarship holders with the research processes, and includes "contact", "research" and "project" ($p \leq 0.001$), present in the excerpts:

> *I really like to implement my* project*, to see the people who won prizes at the fairs, to have contact with the children too. It is very rewarding, we learn a lot, both in science and in humans* (Q10, emphasis added).
>
> *How to do* research*, the scientific method, the technology. All this technical part which I will take into my profession, into my work. But, also about how to share these findings. Thinking about other people, how to share what I know. During the week, I keep thinking about my* project*, what I have to do in my research, and then how I can explain to others what I do and why it is important. Get you out of your bubble* (Q7, emphasis added).

The Similitude Analysis (Figure 4) showed the interconnection of the words present in the adolescents' speeches regarding this *corpus*. Within the second *corpus*, in which the discussions are specifically focused on SP, it is possible to notice in the foreground the association of the words "science", "technology", "research", "knowledge", "contact", "connect" and "pass" with the program itself, demonstrating its connection to its precepts of popularizing science and technology. In the background, it is possible to highlight three large communities, referenced by the words "give", "learn" and "participants [of the SP]".

The community made up of references to SP participants, which contains associations with words such as "like", "involve", "speak", "difference", "understand" and break down into "thinking", "experience", "explaining" and "neighborhood", "space" and "getting to know" (Figure 4). Here, we note the importance of the adolescents multiplying activities, who often refer to students participating in SP in a positive way,

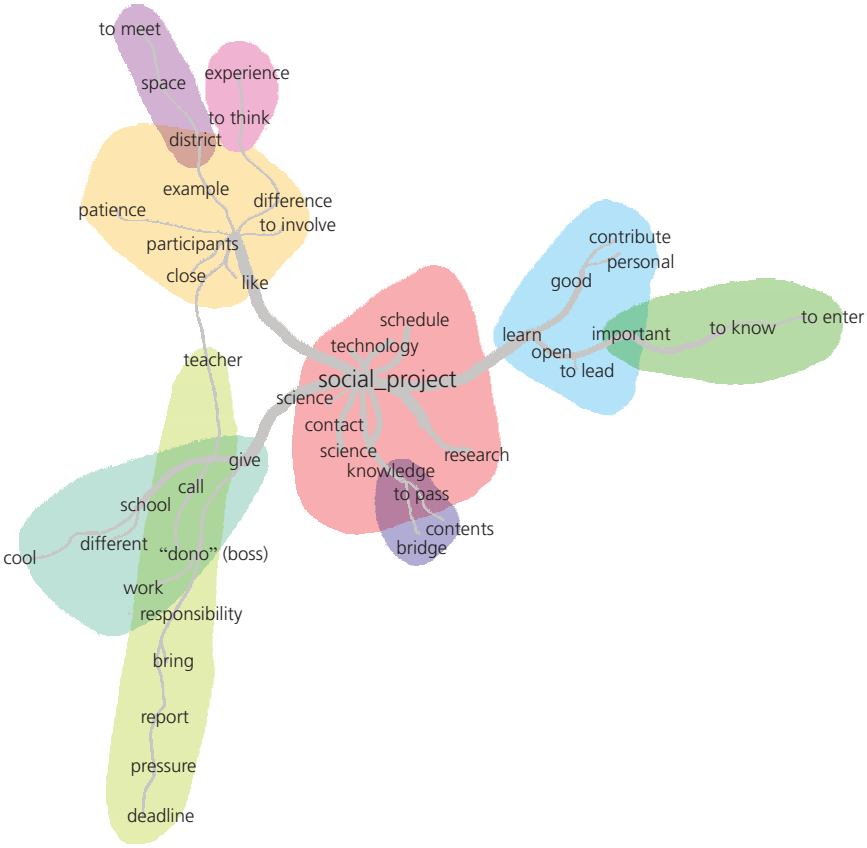

Figure 4. Graph of communities resulting from the Similitude Analysis of thematic reports on the Social Program, according to scholarship holders of the Program (N = 18).

Note: Chi-Square Test – Heavier lines: stronger relationships; lighter lines: weaker relationships.

evaluating the multiplication experiences as engaging and provocative, partly by enabling knowledge of the public and territorial space and by promoting reflections on the activities carried out. From this community, another strand is also broken down based on the word "teacher", which is connected across the community "giving". Here are the contents referring to the activities of multiplication of knowledge with the students of the program, highlighting the responsibilities of being seen as teachers by the students. Thus, there are also reports of adolescents who, from these experiences today, are interested in the idea of working as teachers in the future.

Discussion

From the results, the presence of LP among the adolescents, stands out, as well as it is possible to notice the impact of the cultural and community context in the construction of the LP. The scholarship students report making use of their experiences in SP and in the surrounding community to develop their own LP, one of the central points for the construction of LP, as highlighted by Damon (2009). In addition, it is interesting to highlight the inclusion of connections with other people and institutions in their LP, given that adolescents positively evaluate contact with students and the community served by the SP, and yearn to maintain connections of this type throughout their life. Likewise, their LP and their activities as multipliers give meaning to the academic knowledge learned in the program and in formal education, similar to that found in the study by Yeager and Bundick (2009). Participants say that the responsibility arising from contact with students, added to the task of multiplying more formalized educational content for this audience, makes them need to actually appropriate the content, also requiring skills that involve otherness and empathy to transmit effectively knowledge to a different age group.

Based on the quantitative data, it is possible to establish some characteristics of the LP. Considering the future period of 10 years, in which the emerging adulthood of these young people will materialize, the dimensions of Study and Work stood out. In addition, the verbal reports of these adolescents revealed LP for the near future, such as attending Higher Education or getting a job. On the other hand, it was also possible to note the difficulty in describing these LP concretely. Over a period of more than ten years, the plans have given way to expectations and desires, with teenagers reporting uncertainties about the more distant future. The participants credited this uncertainty to some factors: they relate both the characteristics of their own generation, in which scientific and technological revolutions can impact quick radical changes in people's daily lives, as well as the mutability of their careers in areas related to technology, and the very instability of the political moment in the country.

Another point observed in the results was the low score of the Affective Relationships dimension, which was also not highlighted during the focus group. Likewise what was found in the national study by Riter, Dellazzana-Zanon, and Freitas (2019), which investigated the LP of adolescents of low socioeconomic level regarding affective relationships, the young scholarship students in the present study reported more concern with work and study, leaving projects that involve the formation of romantic or family relationships in a second plan and devoted little reflection to the subject.

In the same way, it was also apparent during discussions that teenagers are not in the habit of projecting themselves so far ahead in the future. During the conversations, these were the periods that involved the most pauses during the dialogue, and the teenagers themselves admitted that they almost never talk about it – even in schools and families they are only made accountable in the short-run, rarely being asked to imagine themselves in the long term. As discussed by the scholarship holders themselves, although this is a topic of interest and which they think about rather often, it is not something they are used to sharing with other

people. When projecting for the more distant future, according to the result presented in Class 4 of Figure 1, happiness – as an abstract concept, without a clear notion of the adolescents about what this happiness would be – becomes the only guide for this period.

Therefore, the importance of the existence of spaces like this is resumed for the discussion of the future expectations of the scholarship holders – in particular, those that allow group discussions among adolescents, enabling the social communication between peers to encourage reflection on their aspirations and desire, and the construction of LP more connected to their community environment (McKnight & Kashdan, 2009). At the same time, the debate on the promotion of the construction of LP in young people is highlighted on the national scenario today, with its insertion of the Law of Guidelines and Bases of National Education in 2017, dealing with the High School curriculum, the need to consider integral training of adolescents and the construction of their life project. According to Sumner et al. (2018), the greater the adolescents' contact and reflection about their own lives and connections with other individuals and communities, the easier they will be able to reflect on their life goals and develop awareness of their LP, even in situations of socioeconomic disadvantage and marginalization - as is the case of most young people participating in this SP.

The Positive Aspirations dimension also showed high scores in both age groups and in both versions of the LPS-A instrument, indicating the adolescents' desire to become better people and to promote positive contributions to society. From this and turning to studies on positive institutions, it is noted that the SP reaches several points raised in the literature, according to Benson and Saito (2000). The program provides settings with joint activities between children and adolescents, aiming at their well-being and with well-defined activities; it also builds socializing systems between this audience and the community, enhancing results involving positive youth development.

In short, the presence of the objectives proposed by Kern et al. (2005) for positive institutions can be observed. The only unidentified objective is related to the positive impact of spirituality promotion. This topic was addressed in two of the groups; teenagers, however, came to the conclusion that this was not a central factor in their lives. Regarding the comments of the participants about the SP, the contact of the adolescents with the students of the weekly activities and with the routine of scientific research stands out. In connection with this topic, the scholarship holders identified individual positive aspects regarding self-esteem, mainly related to activities such as multipliers and to students, to the commitment and involvement with activities and with the program's public, and to learning the content associated with research, technology and computer programming.

They also highlighted in some reports the importance of the experience as a scholarship holder for personal maturity – from requiring teenagers to open bank accounts and follow a reporting schedule, to the responsibility of being in front of a student room, or the patience to deal with kids. Such characteristics are pointed out in the literature as protective factors, helping both the resilience and the positive youth development in general of these adolescents (Lerner et al., 2009). Finally, it is also important to return to the policy of opening technological and educational complexes such as that which the SP hosts for the population, as a vital factor in the popularization of S&T. As presented in the adolescents' reports, especially in the results presented in Figures 3 and 4, participation in this space allows them to get in touch with a vast network of scientific and educational support. For example, several adolescents report that they become knowledgeable of the space and courses of other federal research centers, since entering the program; other adolescents made contact with universities and teaching centers in the region.

Thus, resuming research by the Center for Management and Strategic Studies (2015) on the perception of S&T in the country, which reveals a reality in which a good number of Brazilians do not know scientific research institutions, it is considered vitally important to open research centers for the population as the

experience exposed in SP. Likewise, the program still operates in the wide gap between scientific production and public understanding (Martins et al., 2004). In this connection, the adolescents commented on the process of reframing the formalized scientific content, in order to be able to transmit such knowledge to a population that, in general, has little contact with S&T. Such activities have an impact on the scholarship holders, so that their reports permeate the discussions about LP and the experiences in the program, indicating that the multiplier's role of knowledge also permeates the plans for the future of these adolescents.

Conclusion

The adolescents who participated in this study presented life projects built in connection with the community and related their future projects to their current contribution to the social program, showing the importance of programs that aim to work with aspects of positive youth development. Likewise, it was also possible to note the resignification and appreciation of young people regarding aspects of formal education and the school itself during their contact with the SP. Judging the period of readjustment of the curricular bases of High School for the insertion of the discussion about LP, the present article also presents the relevance of the evaluation of the life projects in the educational context. Furthermore, considering the scarce literature in the field of Psychology related to the assessment of impacts of social programs in the area of S&T, and the fact that there are few quantitative studies on Life Projects for adolescents this study stands out using quantitative and qualitative analyses.

However, it is important to present the limitations of this study, specifically on the fact that the focus is only on the population of the scholarship holders' multipliers of the social program and not analyzing the student population, nor the impacts of these activities on the community covered by the program. It is suggested that future studies investigate the impact of the contribution of young people participating in social programs in their communities and schools.

Contributors

M. F. ARAUJO wrote the research project that originated this article; he collected the data, performed the data processing, interpreted the results and wrote and revised the article. S. R. F. ENUMO was responsible for guiding the research project that originated the article, interpreting the results, writing, and revising the article. L. L. DELLAZZANA-ZANON assisted in the interpretation of results and in the writing and revision of the article. All authors reviewed and approved the final version of the manuscript.

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